CHANGES IN VITAL CAPACITY AND FORCED VITAL CAPACITY WITH AGING IN NORMAL MALE SUBJECT

Kuseshwar Yadav[1] | Srijana Yadav[2]

[1]Dynamic Health Home, Janakpurdham.

[2]Navajiwan Hospital Pvt.Ltd., Janakpurdham.

ABSTRACT

To See the changes VC AND FVC with aging in Normal Male

Objectives:

1) To find the changes in VC and FVC with aging in normal male according to their age.

2) To establish the relationship between VC and FVC.

Method: A total of 150 healthy male individuals in the age group of 10 to 59 years were investigated on the basis of inclusion and exclusion criteria. They were divided into five group, Group A Group B, Group C ,Group D, and Group E. VC and FVC test readings were taken with the help of spirometer.

Result: It is concluded from the spirometric reading that remarkable significant changes take place with aging specially after 40 years.

Conclusion: There was a linear increase in VC and FVC with increasing age and was found that the younger age group, specially 20-29 years had better VC and FVC reading rather than the older age group.

KEYWORDS: Spirometer, VC,FVC and aging.

INTRODUCTION:

Physiological ageing of the lung is associated with dilatation of alveoli, enlargement of airspaces, decrease in exchange surface area and loss of supporting tissue for peripheral airways ("senile emphysema"), changes resulting in decreased static elastic recoil of the lung and increased residual volume and functional residual capacity.[1] At the cellular level, aging is marked by depletion of adult stem cell reservoirs, the inability to maintain baseline homeostasis, a reduced response to stress, an increased accumulation of damaged DNA leading to telomere shortening, and mitochondrial dysfunction [2,3]. The human lung reaches full function and maturation at the age of 20-25 years [4]. Lung function, as measured by forced expiratory volume, then progressively decreases even in the absence of disease, at a rate of 1% per year after the age of 25 years [5,6,7]. As function declines, the lung exhibits multiple age-associated changes, including reduced respiratory muscle strength, increased secretion of pro inflammatory cytokines (IL-1β, IL-6, and TNF-α) even in the absence of acute insult, a reduced immune response [8,9], and alterations in structural extracellular matrix (ECM) proteins (collagen and elastin) [5,6,7]. Lung functional decline is accompanied by structural alterations characterized by enlarged airspaces, loss of surface area [4,10], and a decrease in static elastic recoil [11], often accompanied by changes in compliance [6,7].

METHODOLOGY:

This study was carried out in Dynamic Health Home, Janakpurdham, Navajiwan Hospital Pvt. Ltd., Janakpurdham. Age of participants was ranges from 10 to 59 years . There was 5 group, each group has 30 subjects.

Research design:
Age group: 10 to 59 years.

Sample collection: Simple Random Technique.

Selection criteria:
Inclusion criteria:
Age: 10 to 59 years

Sex: Sex bar, only healthy male subjects were included.

Exclusion criteria :
Had any known respiratory impairments.

Are over anxious.

Are under medication which will affect the test result.

Are having any chest deformity.

Protocol:

150 males with age 10 to 59 years as per inclusion criteria were included. Written consent was taken from volunteer and procedure was explain to them in details. The subject for the study were chosen randomly and were assigned to five group.

Table 1.1: Representing age group

Group	Age (Years)
A	10-19
B	20-29
C	30-39
D	40-49
E	50-59

Procedure for data collection:-
The data collected from each subject are:

1) Vital Capacity (VC) in liter.

2) Forced Vital Capacity(FVC) in Liters.

RESULTS:

The data obtained were tabulated and analyzed using descriptive and interferential statistical methods. To asses the VC and FVC among different age group mean and standard deviation were used.

Pearson's correlation coefficient was used to determine the correlation between VC and FVC variables. ANOVA was used to study variation among the different age group.

The SPSS software was used for various statistical calculation.

Table 1.2: VC measured at different Age groups

VC	Age Group	Mean	S.D.	F-TEST	Significance
Measured	10-19	3.9978	0.7630	3.000	P<0.05
	20-29	4.2230	0.6661		
	30-39	4.2130	0.4167		
	40-49	3.8110	0.3944		
	50-59	3.4790	0.5077		
Total		3.9448	0.6125		

S.D.(Standard Deviation), F(ANOVA Value), P(Probability)

Interpretation:

- Statistically there is significant difference (P<0.05) between measured value of VC and age.

- In the age group 20-29, the mean value of a measured VC is high compare to rest of the groups.

- In the age group 50-59, the mean value of a measured VC is lesser than rest of the age group.

- With the above data, we understand that VC is peaking with third decade of life and linearly declining with age.

Table 1.3: FVC measured in different Age groups

FVC	Age Group	Mean	S.D.	F-TEST	Significance
Measured	10-19 20-29 30-39 40-49 50-59	3.8590 4.3890 4.1890 3.7740 3.5230	0.6664 0.4970 0.2658 0.3027 0.3490	6.011	P<0.05
Total	150	3.9458	0.5242		

S.D.(Standard Deviation), F(ANOVA Value), P(Probability)

Interpretation:

- Statistically there is significant difference (P<0.05) between measured value of FVC and age.

- In the age group 20-29, the mean value of a measured FVC is high compare to rest of the groups.

- In the age group 50-59, the mean value of a measured FVC is lesser than rest of the age group.

- With the above data, we understand that FVC is peaking with third decade of life and linearly declining with age.

Table 1.4: Relationship between VC and FVC

Parameter	Measured Mean	Measured S.D.	'r'	Significance
VC	3.9948	0.1625	-0.318	P<0.05
FVC	3.9458	0.5242	-0.340	P<0.05

DISCUSSION:

Pulmonary function has been the subject of interest in many studies for decades. Though subject has been extensively studied in different countries the west. Literature shows that not all the study have been done in Asian subject. In addition, literature reveals that pulmonary volumes and capacities will peak at 20-30 years of age and linearly declines with increasing age. They also emphasize on certain differences among sexes-value of pulmonary volumes and capacities will be 20-25% less in females compare to males.

The study was design to find the changes in the VC and FVC with increasing age among normal male subject.

The study brought to light the following results:-
It was observed that VC and FVC are peaking over at the age group of 20-29 years and linearly declining with increasing age.

CONCLUSION:

There was Linear increase in VC and FVC with increase in age and was found that younger age group, specially 20-29 years had better VC and FVC than older age group.

The mean value of measured VC and FVC are high in third decade of life. There was a wide variability in FVC and FEV1 aged between 10-59 years.

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